UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

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F/V *Ocean Prowler*

Cruise Report OP-90-01

Longline survey of the Gulf of Alaska

June 26-September 12, 1990

Prepared by

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On September 12, 1990, the National Marine Fisheries Service, Alaska Fisheries Science Center (AFSC), completed the fourth annual longline survey of sablefish (*Anoplopoma fimbria*) resources of the Gulf of Alaska. The survey area extended from the Islands of Four Mountains eastward to Dixon Entrance (Figure 1). This survey was designed to continue the time series (1979-90) of the Gulf of Alaska portion of the Japan-U.S. cooperative longline survey.

OBJECTIVES

1. Determine the relative abundance and size composition of the commercially important species: sablefish, shortspine thornyhead (*Sebastolobus alascanus*); and rougheye and shortraker rockfishes (*Sebastes aleutianus* and *S. borealis*).

2. Determine the relative abundance and size composition of other groundfish species caught during the survey including Pacific cod (*Gadus macrocephalus*), arrowtooth flounder (*Atheresthes stomias*), grenadiers (Macrouridae), and Pacific halibut (*Hippoglossus stenolepis*). (Size composition of Pacific halibut was not studied.)

VESSEL AND GEAR

Survey operations were conducted using the F/V *Ocean Prowler*, a chartered U.S. longline vessel. The 47.24 m (155 ft) vessel carried standard longline hauling gear and was equipped with radios, radars, LORAN receivers, track plotter, a processing line, three sets of plate freezers, and refrigerated holds. Vessel personnel consisted of a captain, an engineer, a cook, five to six fishermen, and five processors.

Gear configuration was unchanged from that of the 1988 and 1989 surveys. Units

of gear (skates) were 100 m (55 fm) long and contained 45 size 13/0 Mustad[1] circle hooks. Hooks were attached to 38 cm (15 in) gangions that were secured to beckets tied into the groundline at 2 m (6.5 ft) intervals. Five meters (16 ft) of groundline were left bare at each end. Gangions were constructed of medium lay #60 thread nylon, becket material was medium lay #72 thread nylon, and groundline was medium lay 9.5 mm (3/8 in) diameter nylon.

Each end of a set started with a flag and buoy array followed sequentially by a 9.5 mm diameter nylon buoyline, a 92 m (50 fm) section of 9.5 mm polypropylene floating line, a 16 kg (35 lb) piece of chain (to dampen the effect of wave surge on the buoyline), 92 m of 9.5 mm nylon line, a 27 kg (60 lb) halibut anchor, and 366 m (200 fm) of 9.5 mm nylon line. The groundline was weighted with 3.2 kg (7 lb) lead balls at the end of each skate. Hooks were hand baited with chopped squid (*Illex* spp.) at a rate of about 5.7 kg (12.5 lb) per 100 hooks. Squid heads and tentacles were not used for bait.

Total groundline set each day was 16 km (8.6 nmi) long and contained 160 skates and 7,200 hooks. Two 80 skate groundlines laid end to end were set at each station along the upper continental slope. Usually a single groundline of 80 skates was set at each station in the gullies.

The AFSC supplied the longline gear except for the flags, buoys, buoylines, and anchors, which were furnished by the charter vessel owners. The owners also supplied the bait and paid for transportation of the gear from Seattle to the survey area and return.

OPERATIONS

The charter began in Unalaska, Alaska, and ended in Petersburg, Alaska. The charter period was divided into three legs of 25 working or traveling days. During Leg 1, the survey sampled from the Islands of Four Mountains eastward to Shelikof Strait. Leg 2 began near Chirikof Island and continued eastward to Yakutat. Leg 3 completed the survey from Yakutat to Dixon Entrance.

Seventy-nine days were used to complete the survey including 2 days for loading and unloading gear, one day to set up equipment, 5 travel days, one day lost to bad weather, one day to transport an injured crewman for treatment of a leg injury, 4 days for port calls, and 65 days of survey sampling.

Survey operations

Forty-five stations were sampled along the upper continental slope of the Gulf of Alaska at a rate of one station per day (Figure 1). These stations correspond to station numbers 62-86, 88-102, and 104-108 of the Japan-U.S. cooperative longline survey. Surveyed depths ranged from approximately 200-1,000 m, although at some stations, depths less than 150 m or more than 1,000 m were sampled (Table 1).

Twenty-seven stations were sampled in gullies at the rate of two stations per day. Twenty-six of these stations are additional to the stations established by the cooperative longline survey. The exception is station 26 in Amatuli Gully, which corresponds to station 87 of the cooperative longline survey. The sampled gullies are Shumagin Gully, Shelikof Trough, Amatuli Gully, W-grounds, Yakutat Valley, Alsek Strath, Spencer Gully, Ommaney Trench, Iphigenia Gully, and Dixon Entrance.

One station (42) was sampled on the shelf off Baranof Island and corresponds to

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[1]Citation of the above brand name does not constitute U.S. government endorsement.

station 103 of the cooperative longline survey. Five stations were repeated to study catch rate variability.

The gear was set from shallow to deep and was retrieved in the same order, except on occasions when groundlines parted or sea conditions dictated that it be pulled from the opposite direction. Setting began about 0630 h. Retrieval began about 0930 h and was completed by about 1930 h.

Data collection

During gear retrieval a scientist recorded the species of each hooked fish, the condition of each unoccupied hook (absent, broken, or tangled), and whether bait remained on the hook. Time of day and depth were recorded when the first and last skates came aboard, at the beginning of each fifth skate, and when crossing into a new depth interval (0-100 m, 101-200 m, 201-300 m, 301-400 m, 401-600 m, 601-800 m, 801-1,000 m and 1,001-1,200 m).

Length was measured for sablefish, Pacific cod, grenadiers, arrowtooth flounder, rockfish, and thornyheads. Only lengths of sablefish and Pacific cod were recorded by depth interval. Pacific halibut were counted and released at the rail without measuring.

As in the previous surveys, the charter vessel was allowed to retain most of the catch once the scientific data were recorded.

RESULTS

One hundred and thirty longline hauls (sets) were completed (Table 1). Killer whales picked some of the fish caught at station 9 (hauls 17 and 18). Eighty, 20, and 60 skates were lost due to hang-ups at stations 10, 37, and 46, respectively.

Sablefish was the most frequently caught species, followed by grenadiers, Pacific cod, and arrowtooth flounder (Table 2). A total of 109,883 sablefish, with an estimated total round weight of 366,294 kg (807,312 lb), was taken during the survey (Table 3).

Preliminary analyses indicate that the relative abundance of sablefish on the upper continental slope in 1990 generally increased about 20% since 1989, to the same level as in 1988, whereas sablefish catch rates in gullies decreased from 1989-90, notably in Shumagin Gully and Shelikof Trough. Judging from length frequencies collected during previous NMFS longline surveys, the changes appear to be related to offshore movement of young adults from the gullies. The net effect of the decreases in gullies and the increases on the upper continental slope is that overall sablefish abundance is unchanged from 1989. On a gulfwide basis, mean lengths of sablefish were similar from 1989-90.

Grenadier total catch decreased slightly from 1989-90, but stations west of Kodiak still produced the largest catches. Pacific cod catches were higher than in 1989. Shelikof Trough stations (48-51) produced 76% of the total survey catch of Pacific cod. Arrowtooth flounder total catch was increased notably due to a large catch at slope station 14, just outside Shelikof Trough.

A more meaningful index of abundance (catch-per-unit-effort by depth) and more detailed size compostion analyses will be reported in a subsequent technical document.

SCIENTIFIC PERSONNEL

Leg I (June 26 - July 20)
Harold Zenger, Field Party Chief, RACE
Michael Martin, RACE
Dan Kamikawa, ABL

Leg II (July 23 - August 16)
Michael Martin, Field Party Chief, RACE
Greg Olewiler, RACE
Chris Derrah, ABL

Leg III (August 19 - September 12)
Michael Sigler, Field Party Chief, ABL
Greg Olewiler, RACE
Larry Haaga, RACE

RACE - Resource Assessment and Conservation Engineering Division
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For further information contact either

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Table 1.--Haul number (set), preassigned station number, and starting and ending positions and depths for the 1990 NMFS longline survey of the Gulf of Alaska, June 26 - September 12.

Haul no.	Station no.	Start lat. (ddmm.m)	Start long. (dddmm.m)	End lat. (ddmm.m)	End long. (dddmm.m)	Start depth (m)	End depth (m)
1	1	5234.5	16931.5	5230.3	16934.3	142	320
2	1	5229.3	16934.6	5225.0	16937.2	285	465
3	2	5257.8	16808.4	5254.5	16812.3	118	411
4	2	5254.3	16812.5	5250.3	16813.9	440	750
5	3	5311.8	16651.7	5307.0	16654.0	211	311
6	3	5306.6	16654.3	5302.3	16657.8	322	1,040
7	4	5334.8	16541.3	5330.7	16543.8	123	288
8	4	5330.5	16543.9	5326.6	16545.8	301	527
9	5	5343.9	16428.5	5340.8	16433.6	137	314
10	5	5340.8	16434.2	5337.6	16439.3	315	722
11	6	5358.4	16315.9	5354.7	16320.8	114	314
12	6	5354.4	16321.2	5350.9	16326.3	440	732
13	7	5407.8	16138.6	5405.6	16144.9	137	326
14	7	5405.5	16145.7	5403.6	16153.1	467	890
15	8	5418.8	16103.8	5415.6	16109.2	206	430
16	8	5415.5	16109.7	5412.5	16115.2	451	851
17	9[a]	5421.5	16014.3	5417.2	16016.6	145	427
18	9	5417.0	16016.8	5412.7	16019.3	444	738
19	254[b]	5506.5	15830.5	5503.1	15835.7	191	203
20	154	5502.6	15831.3	5459.3	15837.0	210	148
21	10	5430.4	15915.7	5426.9	15919.8	141	280
22[c]	10	5426.0	15919.8	5422.2	15924.4	288	909
23	309	5421.6	16014.5	5417.3	16017.3	145	404
24	309	5416.9	16017.7	5412.6	16020.2	433	788
25	11	5437.6	15834.9	5433.6	15838.8	132	421
26	11	5433.3	15839.1	5429.5	15843.4	431	867
27	12	5450.8	15744.7	5446.8	15749.4	190	400
28	12	5446.4	15749.9	5442.1	15753.3	397	517
29	13	5414.1	15640.8	5410.3	15644.4	184	326
30	13	5510.0	15644.8	5506.2	15645.4	312	723
31	14	5538.2	15550.9	5534.0	15551.3	162	212
32	14	5533.9	15551.5	5529.8	15550.1	213	211
33	149	5547.3	15604.7	5545.8	15611.8	206	239
34	249	5544.9	15612.2	5543.9	15619.7	243	250
35	150	5611.2	15557.9	5610.8	15606.0	196	240
36	250	5613.8	15608.0	5615.3	15615.2	247	265
37	148	5659.3	15503.8	5659.9	15511.7	167	235
38	248	5700.2	15518.5	5702.7	15524.6	254	264
39	151	5720.8	15502.7	5721.0	15511.4	239	243
40	251	5720.7	15515.4	5719.5	15523.6	247	257
41	15	5545.7	15508.1	5542.1	15510.7	159	299
42	15	5541.9	15510.8	5538.3	15514.4	308	578
43	16	5602.2	15434.0	5558.1	15534.5	240	545
44	16	5557.6	15434.2	5553.3	15433.2	580	886
45	17	5558.2	15401.4	5554.0	15400.7	238	508
46	17	5553.6	15401.1	5549.2	15403.1	540	982
47	18	5617.1	15305.0	5615.1	15311.3	294	568
48	18	5615.3	15312.2	5612.1	15316.6	516	799
49	19	5628.2	15205.4	5624.1	15208.4	126	238
50	19	5623.9	15208.5	5621.6	15214.7	238	646
51	20	5707.1	15113.3	5703.2	15116.9	230	519
52	20	5702.8	15117.6	5658.7	15118.0	548	847

Table 1.--continued

Haul no.	Station no.	Start lat. (ddmm.m)	Start long. (dddmm.m)	End lat. (ddmm.m)	End long. (dddmm.m)	Start depth (m)	End depth (m)
53	21	5723.9	15034.8	5719.5	15036.1	200	470
54	21	5719.3	15036.5	5715.2	15036.7	480	680
55	22	5737.5	14955.6	5733.2	14957.7	397	569
56	22	5732.6	14958.2	5728.1	14959.8	584	944
57	23	5758.1	14910.6	5754.9	14915.8	165	480
58	23	5754.6	14916.6	5750.9	14921.1	495	854
59	24	5857.4	14837.5	5813.3	14839.6	202	509
60	24	5812.9	14840.4	5808.4	14842.3	520	803
61	25	5841.0	14820.7	5836.7	14820.7	283	373
62	25	5836.5	14820.1	5832.1	14818.4	390	988
63	159	5843.5	14911.7	5846.1	14905.1	173	217
64	259	5848.2	14902.8	5850.3	14855.9	235	251
65	26	5907.4	14839.2	5903.0	14839.1	152	196
66	26	5902.7	14838.9	5858.4	14838.9	206	240
67	27	5909.2	14736.8	5909.3	14736.2	222	431
68	27	5904.4	14738.2	5859.5	14739.1	457	976
69	28	5915.5	14651.6	5812.4	14657.9	192	640
70	28	5911.9	14659.5	5909.6	14707.1	665	941
71	29	5929.9	14532.3	5930.1	14540.9	159	758
72	29	5930.3	14542.8	5930.2	14551.6	232	836
73	30	5931.1	14443.1	5929.1	14451.0	180	457
74	30	5928.8	14452.2	5926.0	14459.5	464	1,077
75	31	5933.1	14339.6	5933.4	14348.2	177	658
76	31	5933.5	14349.1	5934.1	14355.6	621	873
77	262	5940.5	14323.4	5943.1	14330.6	293	310
78	162	5944.7	14334.0	5944.9	14342.4	304	157
79	32	5932.9	14234.3	5935.0	14241.0	128	593
80	32	5935.5	14241.8	5934.4	14248.0	585	640
81	33	5923.3	14210.4	5925.8	14217.5	243	416
82	33	5926.0	14218.1	5927.9	14224.7	433	548
83	34	5903.1	14121.2	5903.0	14129.8	282	567
84	34	5903.1	14131.3	5903.1	14138.9	569	972
85	163	5925.0	14056.9	5925.6	14105.4	227	300
86	263	5920.8	14116.2	5924.7	14110.5	324	329
87	35	5841.1	14038.7	5841.5	14046.5	251	542
88	35	5841.6	14047.0	5843.8	14053.4	542	630
89	36	5828.2	13928.3	5827.6	13936.2	215	450
90	36	5827.7	13937.0	5825.3	13943.1	420	833
91	164	5839.9	13905.3	5839.8	13913.6	167	250
92	264	5838.7	13920.1	5836.4	13927.4	255	257
93	37	5808.5	13843.6	5809.1	13851.3	216	640
94[d]	37	5809.5	13852.0	5810.6	13857.5	595	632
95	38	5752.7	13723.0	5753.7	13730.2	191	536
96	38	5753.8	13730.7	5753.4	13737.6	581	786
97	160	5754.9	13701.4	5755.3	13709.1	444	387
98	260	5757.9	13703.8	5758.0	13712.2	432	241
99	39	5737.2	13632.0	5736.7	13638.5	201	737
100	39	5736.9	13639.4	5738.6	13643.8	709	861
101	40	5711.3	13614.4	5713.2	13619.3	249	714
102	40	5713.7	13619.0	5713.3	13624.0	723	803
103	41	5651.4	13559.8	5653.9	13605.3	210	696
104	41	5654.1	13605.6	5657.6	13606.6	590	821
105	42	5623.1	13521.0	5623.1	13528.3	155	187
106	42	5623.7	13528.4	5622.3	13535.4	186	225

Table 1.--continued

Haul no.	Station no.	Start lat. (ddmm.m)	Start long. (dddmm.m)	End lat. (ddmm.m)	End long. (dddmm.m)	Start depth (m)	End depth (m)
107	153	5556.0	13453.9	5600.2	13455.0	206	370
108	253	5602.3	13456.2	5605.1	13401.4	370	369
109	43	5559.0	13526.2	5601.1	13532.0	351	703
110	43	5601.4	13532.5	5604.2	13537.2	695	867
111	44	5533.5	13458.1	5534.7	13503.7	242	657
112	44	5555.3	13504.3	5537.9	13508.5	614	770
113	165	5531.8	13424.4	5534.5	13430.2	189	247
114	265	5531.8	13440.1	5534.4	13445.6	290	264
115	45	5520.7	13443.6	5523.0	13449.3	369	672
116	45	5523.7	13449.9	5523.7	13456.5	556	774
117	46	5454.3	13417.2	5457.6	13420.4	228	520
118[e]	46	5457.8	13420.6	5500.4	13425.6	540	840
119	47	5427.0	13355.8	5429.0	13400.2	215	563
120	47	5429.4	13400.3	5433.4	13404.4	576	730
121	161	5438.4	13250.7	5436.0	13308.4	157	380
122	261	5435.9	13301.5	5436.0	13256.4	411	392
123	345	5520.8	13444.1	5523.4	13449.8	420	613
124	345	5523.8	13449.8	5523.3	13456.8	572	823
125	344	5533.9	13501.8	5536.5	13507.3	507	778
126	344	5537.3	13507.5	5539.4	13513.0	675	1,182
127	343	5558.8	13527.3	5601.3	13531.7	438	660
128	343	5601.8	13532.0	5603.8	13537.1	617	887
129	353	5556.1	13454.4	5600.8	13454.4	206	360
130	453	5602.2	13455.8	5605.2	13402.0	373	358

[a] Killer whales picked some of the fish caught at station 9.

[b] Three digit station numbers in the 100's and 200's refer to adjacent gully stations, where the first digit represents the set number and the next two refer to the station number that appears in Figure 1. Stations in the 300's and 400's are replicated stations, where the last two digits refer to the station number. Each haul (or set) contains 80 skates of gear.

[c] 80 skates lost.

[d] 60 skates lost.

[e] 25 skates lost.

Table 2.--Catch in number by species and station for the 1990 NMFS longline survey of the Gulf of Alaska, June 26 - September 12. SF = sablefish, PC = Pacific cod, GR = grenadiers, PH = Pacific halibut, ATF = arrowtooth flounder, RF = rockfish, ST = shortspine thornyheads, SK = skates, and OS = other species[a].

Station	SF	PC	GR	PH	ATF	RF	ST	SK	OS[a]
1	865	114	482	239	171	625	169	112	14
2	692	487	1,308	446	229	464	250	32	26
3	693	143	731	162	388	174	158	22	33
4	780	1,359	767	213	469	28	93	51	38
5	1,940	186	1,152	23	157	45	130	9	18
6	991	356	1,035	446	54	92	75	10	103
7	871	526	1,028	206	308	212	69	6	13
8	1,287	306	1,807	37	149	15	166	1	51
9[b]	1,158	530	1,491	18	54	9	98	3	5
10[c]	780	849	0	17	76	1	4	0	0
11	1,465	284	1,865	19	134	71	137	4	67
12	1,015	588	1,676	22	164	63	128	1	16
13	1,404	225	1,506	69	155	42	212	2	58
14	1,281	1,192	0	288	1,339	19	0	7	46
15	1,939	291	738	65	359	28	39	48	122
16	2,102	17	1,489	20	189	91	267	4	49
17	2,269	9	539	38	49	40	98	11	435
18	2,715	0	616	5	55	41	128	2	205
19	2,248	460	239	333	223	172	52	14	50
20	1,925	20	1,145	76	249	73	59	4	280
21	2,032	36	496	58	253	184	43	4	44
22	1,621	0	1,262	1	3	2	133	1	215
23	1,663	134	773	223	72	87	73	7	144
24	1,672	83	623	28	193	123	151	5	68
25	1,231	1	407	95	109	215	103	5	139
26	2,016	187	0	197	362	5	46	152	48
27	1,537	380	781	60	44	209	64	6	325
28	2,358	15	855	19	5	65	87	1	559
29	1,782	38	754	18	6	265	51	18	256
30	1,995	215	308	91	58	205	108	20	196
31	2,115	21	351	5	26	72	145	1	249
32	3,175	27	142	49	6	23	114	6	26
33	1,256	0	320	47	115	183	189	15	379
34	2,423	0	327	20	57	330	162	12	103

Table 2.--continued

Station	SF	PC	GR	PH	ATF	RF	ST	SK	OS
35	1,811	0	417	14	83	251	37	11	39
36	1,737	5	365	4	46	468	93	13	43
37[d]	916	0	197	7	10	147	27	4	19
38	2,280	0	176	14	13	61	73	29	79
39	2,399	26	246	21	5	92	60	6	62
40	2,838	12	60	30	19	79	83	4	65
41	2,496	7	162	26	5	25	52	5	119
42	638	355	0	422	40	1	5	29	637
43	2,497	0	93	8	9	393	153	16	65
44	2,151	68	96	47	29	219	74	17	154
45	2,889	0	105	0	2	121	92	3	35
46[e]	1,495	15	65	20	4	194	101	9	82
47	1,156	0	118	0	9	352	139	10	56
148[f]	368	1,046	0	230	363	7	0	29	18
248	380	733	0	248	432	3	0	47	35
149	699	676	0	33	542	34	0	30	16
249	818	525	0	79	504	3	0	62	16
150	798	476	0	75	381	0	0	72	27
250	1,015	627	0	85	334	1	0	74	9
151	247	744	0	154	379	1	0	80	68
251	806	962	0	91	158	1	0	30	51
153	400	79	0	69	171	93	244	51	92
253	1,608	0	0	25	66	33	62	27	79
154	405	242	0	95	185	4	0	31	34
254	95	41	0	45	61	4	0	17	18
159	602	5	0	40	66	9	14	43	5
259	1,639	20	0	89	106	10	43	31	19
160	1,819	0	25	4	11	3	71	4	3
260	1,686	0	18	13	15	11	7	15	4
161	851	69	0	85	63	11	70	60	161
261	1,007	0	0	14	4	27	26	43	39
162	627	5	0	141	89	0	2	37	61
262	1,378	0	0	29	18	0	31	11	27
163	707	4	0	95	115	11	83	38	123
263	1,330	0	0	25	17	13	32	14	8
164	380	33	0	77	152	7	4	53	91
264	383	1	0	66	86	3	16	54	31
165	86	395	0	339	42	0	0	26	124

Table 2.--continued

Station	SF	PC	GR	PH	ATF	RF	ST	SK	OS
265	441	208	0	326	20	22	29	12	30
309	1,007	501	2,114	45	176	45	88	0	12
343	2,262	0	134	10	6	353	228	6	160
344	2,005	0	319	1	6	24	80	2	503
345	1,703	7	124	3	43	368	157	12	100
353	157	127	0	318	157	50	177	63	66
453	1,575	0	0	40	44	7	55	12	68
Total	109,883	17,093	31,847	7,255	11,366	7,836	6,344	1,852	7,933

[a] Other species: spiny dogfish, Pacific sleeper shark, blue shark, spotted ratfish, Greenland turbot, flathead sole, English sole, Dover sole, rock sole, searcher, Pacific pomfret, Pacific grenadier, unidentified sculpins, armorhead sculpin, blackfin sculpin, yellow Irish lord, Pacific flatnose, walleye pollock, unidentified greenling, lingcod, coho salmon, giant wrymouth, unidentified eelpout, twoline eelpout, Pacific ocean perch; silvergray, dusky, greenstriped, rosethorn, tiger, canary, redstripe, yelloweye, and redbanded rockfishes; sea pens, sea anemones, true tanner crab (*Chionoecetes tanneri*), tanner crab (*C. bairdi*), scarlet king crab, golden king crab, snails, red octopus, starfish, brittlestars, basketstars, and sponges.

[b] Killer whales picked some of the fish caught at station 9.

[c] 80 effective skates (deep set lost)

[d] 60 skates lost at deep end of second set

[e] 25 skates lost at deep end of second set

[f] Three digit station numbers in the 100's and 200's refer to adjacent gully stations, where the first digit represents the set number and the next two refer to the station number that appears in Figure 1. Stations in the 300's and 400's are replicated stations, where the last two digits refer to the station number. Each haul (or set) contains 80 skates of gear.

Table 3.--Mean length, mean round weight, mean dressed weight, number, and estimated total round weight of sablefish, by station, for the 1990 NMFS longline survey of the Gulf of Alaska, June 26 - September 12.

Station number	Mean length (cm)	Mean round weight (kg)[a]	Mean dressed weight (lb)[b]	Number of sablefish	Estimated total round weight (kg)[c]
1	66.0	3.1	4.1	865	2,682
2	69.1	3.6	4.8	692	2,491
3	66.4	3.2	4.2	693	2,218
4	64.9	3.0	4.0	780	2,340
5	62.4	2.7	3.6	1,940	5,238
6	67.5	3.5	4.6	991	3,469
7	71.3	4.0	5.3	871	3,484
8	68.6	3.6	4.8	1,287	4,633
9[d]	65.0	3.0	4.0	1,158	3,474
10[e]	64.1	2.8	3.7	780	2,184
11	65.3	3.0	4.0	1,465	4,395
12	67.0	3.3	4.4	1,015	3,350
13	69.1	3.6	4.8	1,404	5,054
14	67.1	3.3	4.4	1,281	4,227
15	66.0	3.1	4.1	1,939	6,011
16	66.7	3.2	4.2	2,102	6,726
17	67.3	3.3	4.4	2,269	7,488
18	68.9	3.6	4.8	2,715	9,774
19	68.5	3.5	4.6	2,248	7,868
20	67.5	3.4	4.5	1,925	6,545
21	66.7	3.2	4.2	2,032	6,502
22	68.0	3.5	4.6	1,621	5,674
23	68.2	3.5	4.6	1,663	5,821
24	67.6	3.4	4.5	1,672	5,685
25	68.0	3.5	4.6	1,231	4,309
26	65.4	3.0	4.0	2,016	6,048
27	67.8	3.4	4.5	1,537	5,226
28	70.4	3.9	5.2	2,358	9,196
29	69.3	3.7	4.9	1,782	6,593
30	67.8	3.5	4.6	1,995	6,983
31	66.6	3.3	4.4	2,115	6,980
32	66.1	3.2	4.2	3,175	10,160
33	67.1	3.3	4.4	1,256	4,145

Table 3.--continued

Station number	Mean length (cm)	Mean round weight (kg)	Mean dressed weight (lb)	Number of sablefish	Estimated total round weight (kg)
34	67.9	3.5	4.6	2,423	8,481
35	68.0	3.5	4.6	1,811	6,339
36	67.3	3.4	4.5	1,737	5,906
37[f]	67.7	3.4	4.5	916	3,114
38	71.2	4.1	5.4	2,280	9,348
39	70.3	3.9	5.2	2,399	9,356
40	68.6	3.6	4.8	2,838	10,217
41	71.4	4.1	5.4	2,496	10,234
42	63.3	2.8	3.7	638	1,786
43	66.0	3.2	4.2	2,497	7,990
44	66.3	3.2	4.2	2,151	6,883
45	67.1	3.3	4.4	2,889	9,534
46[g]	66.6	3.3	4.4	1,495	4,934
47	66.1	3.2	4.2	1,156	3,699
148[h]	64.7	2.9	3.8	368	1,067
248	66.6	3.2	4.2	380	1,216
149	69.3	3.6	4.8	699	2,516
249	64.4	2.8	3.7	818	2,290
150	67.1	3.2	4.2	798	2,554
250	65.9	3.0	4.0	1,015	3,045
151	65.1	3.0	4.0	247	741
251	67.4	3.3	4.4	806	2,660
153	64.7	3.0	4.0	400	1,200
253	66.3	3.3	4.4	1,608	5,306
154	64.2	2.9	3.8	405	1,175
254	63.9	2.8	3.7	95	266
159	64.4	2.9	3.8	602	1,746
259	69.3	3.7	4.9	1,639	6,064
160	67.8	3.4	4.5	1,819	6,185
260	66.2	3.2	4.2	1,686	5,395
161	69.1	3.7	4.9	851	3,149
261	63.6	2.8	3.7	1,007	2,820
162	64.2	2.9	3.8	627	1,818
262	58.1	2.1	2.8	1,378	2,894
163	62.3	2.7	3.6	707	1,909

Table 3.--continued

Station number	Mean length (cm)	Mean round weight (kg)	Mean dressed weight (lb)	Number of sablefish	Estimated total round weight (kg)
263	62.2	2.6	3.4	1,330	3,458
164	64.8	3.3	4.4	380	1,254
264	62.6	2.8	3.7	383	1,072
165	64.5	3.0	4.0	86	258
265	61.2	2.6	3.4	441	1,147
309	64.7	2.9	3.8	1,007	2,920
343	67.1	3.3	4.4	2,262	7,465
344	69.6	3.7	4.9	2,005	7,419
345	65.6	3.1	4.1	1,703	5,279
353	65.8	3.1	4.1	157	487
453	64.9	3.0	4.0	1,575	4,725
				109,883	366,294

[a] Mean weight was estimated by applying a length-weight relationship to the length frequency distributions for each station.

[b] Mean dressed weight was estimated using a recovery rate of 0.6 of round weight.

[c] Estimated total round weight is the product of mean round weight and the number of sablefish that came to the rail, including a small percentage that was lost during landing.

[d] Killer whales picked some of the fish caught at station 9.

[e] 80 skates of gear lost

[f] 60 skates of gear lost

[g] 25 skates of gear lost

[h] Three digit station numbers in the 100's and 200's refer to adjacent gully stations, where the first digit represents the set number and the next two refer to the station number that appears in Figure 1. Stations in the 300's and 400's are replicated stations, where the last two digits refer to the station number. Each haul (or set) contains 80 skates of gear.

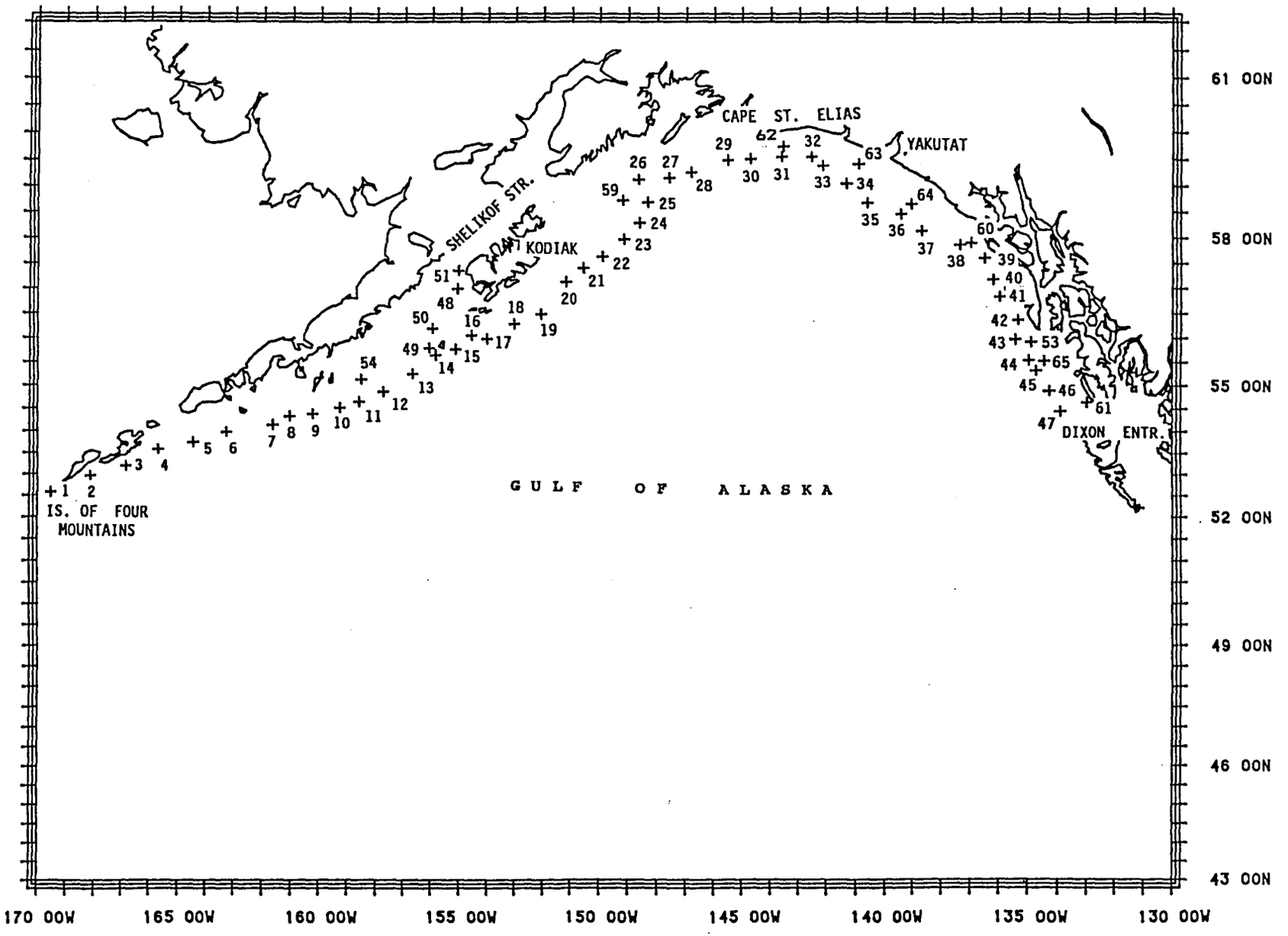

Figure 1.--Station locations for the 1990 NMFS Gulf of Alaska longline survey. Station numbers between 48 and 65 refer to gully stations and actually represent a pair of adjacent stations (e.g. 53 locates stations 153 and 253).